

Optional Column Selection Valve

User Manual

Important user information

All users must read this entire manual to fully understand the safe use of ÄKTAdesign instruments.

WARNING!



The Warning sign highlights an instruction that must be strictly followed in order to **avoid personal injury**. Be sure not to proceed until the instructions are clearly understood and all stated conditions are met.

Caution!

The Caution sign is used to call attention to instructions or conditions that must be followed to **avoid damage to the product or other equipment**. Be sure not to proceed until the instructions are clearly understood and all stated conditions are met.

Note

The Note sign is used to indicate information important for trouble-free and optimal use of the product.

CE Certification

This product meets all requirements of applicable CE-directives. A copy of the corresponding Declaration of Conformity is available on request.

The CE symbol and corresponding declaration of conformity is valid for the instrument when it is:

- used as a stand-alone unit, or
- connected to other CE-marked Amersham Biosciences instruments, or
- connected to other products recommended or described in this manual, and
- used in the same state as it was delivered from Amersham Biosciences except for alterations described in this manual.

WARNING!

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Terms and Conditions of Sale

Unless otherwise agreed in writing, all goods and services are sold subject to the terms and conditions of sale of the company within the Amersham Biosciences group which supplies them. A copy of these terms and conditions is available on request.

Should you have any comments on this product, we will be pleased to receive them at:

Amersham Biosciences AB
SE-751 84 Uppsala
Sweden

Trademarks

Drop Design, ÄKTA, ÄKTAfPLC, ÄKTApurifier, ÄKTAbasic and UNICORN are trademarks of Amersham Biosciences Limited.

Amersham and Amersham Biosciences are trademarks of Amersham plc.

Office Addresses

Amersham Biosciences AB
SE-751 84 Uppsala
Sweden

Amersham Biosciences Limited
Pollards Wood
Nightingales Lane
Chalfont St. Giles
Bucks HP8 4SP
UK

Amersham Biosciences Corp.
800 Centennial Avenue
P.O. Box 1327
Piscataway, N.J. 08855
USA

Amersham Biosciences Europe GmbH
Munzinger Strasse 9
D-79111 Freiburg
Germany

Amersham Biosciences K.K.
Sanken Building
3-25-1 Hyakunincho, Shinjuku-ku
Tokyo 169-0073
Japan

Contents

1	Introduction	7
1.1	General	7
1.2	Optional column selection valve	7
2	Safety	9
2.1	Safety	9
3	Unpacking	10
4	Pre-requisites	11
5	Mounting of brackets	12
5.1	Valve ID	13
5.2	UniNet Connection	14
6	Installation	15
6.1	Preparation for use	15
7	Operation	17
7.1	Preparing for operation	17
7.2	ÄKTAfplc/ÄKTApurifier/ÄKTAbasic - UNICORN 3.2 - 3.21	18
7.3	ÄKTAfplc/ÄKTApurifier/ÄKTAbasic - UNICORN 4.0 - 4.12	20

Contents

1 Introduction

1.1 General

ÄKTAdesign standard system configurations can be changed to optional configurations. This flexibility in ÄKTAdesign system strategies allows the user to enhance already used purification methods and also to develop new, more complex methods.

When optional equipment is connected to a standard chromatographic system, new sets of instructions to control the optional equipment become accessible for the user.

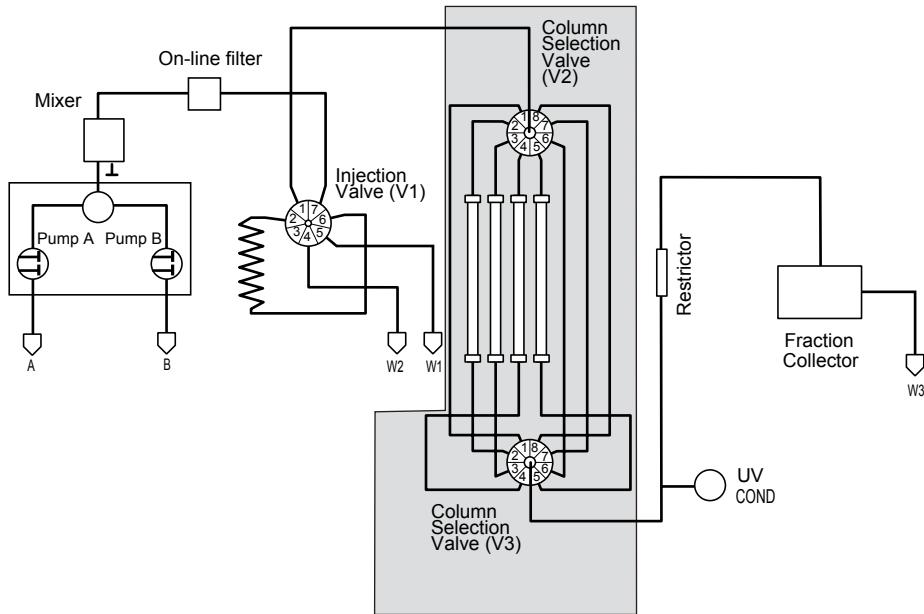
Optional configurations are selected, installed and put into operation by the user. An optional configuration consists of both hardware components and software instructions.

Optional configurations are monitored and controlled via methods run by the UNICORN™ control system in the same way as ÄKTAdesign standard system configurations.

1.2 Optional column selection valve

Column and media screening can be automated by adding two motorized valves onto the system. This setup allows:

- Automated method optimization and multi-step purification as well as column selection.
- Up to eight columns can be connected onto the system. Column performance can be easily compared while changing conditions in a run. The setup is time saving and increases reproducibility of the results.
- Preset protocols will prevent over-pressurization and protect columns from breaking.



The optional column selection valve (code no. 18-1108-41) is available for:

- ÄKTAfPLC™ with UNICORN Software 3.2 or higher
- ÄKTApurifier™ with UNICORN Software 3.21 AA or higher
- ÄKTAbasic™ with UNICORN Software 3.21 AA or higher

2 Safety

2.1 Safety

- The components are designed for indoor use only.
- Do not use in a dusty atmosphere or close to spraying water.
- Operate in accordance with local safety instructions.



WARNING! When using hazardous chemicals, all suitable protective measures, such as protective glasses, must be taken.



WARNING! Ensure that the entire chromatographic system has been flushed thoroughly with distilled water before removing any capillaries or components.



WARNING! Always disconnect the power supply before attempting to replace any item on the equipment during maintenance.



WARNING! If there is a risk that large volumes of spilt liquid may penetrate the casing of the equipment and come into contact with the electrical components, immediately switch off the chromatographic system and contact an authorized service technician.

CAUTION! Make sure that the ÄKTAdesign instrument is switched off before installing the optional components. The mains power to the ÄKTAdesign instrument must be switched OFF before disconnecting or connecting the UniNet-1 and UniNet-2 cables.

3 Unpacking

Unpack the optional components and check against the supplied packing list. Inspect the items for obvious damage that may have occurred during transportation.

CAUTION! Read the following information carefully, as well as all the additional instructions supplied with the components, to ensure that the ÄKTAdesign optional equipment is installed correctly.

4 Pre-requisites

The general procedures for creating and editing methods are described in the *UNICORN User Manuals*.

Note: *The system configuration delay volume must be recalculated and reset when the standard configuration after the UV flow cell is changed.*

ÄKTAfPLC, ÄKTApurifier and ÄKTAbasic respectively must be installed and fully tested before the optional components are installed. See the *Installation Guide* for your ÄKTAdesign chromatography system.



WARNING! Ensure that the entire system has been flushed thoroughly with distilled water before removing any capillaries or components.

CAUTION! Make sure that the ÄKTAdesign instrument is switched off before installing the optional components. The mains power to the ÄKTAdesign instrument must be switched OFF before disconnecting or connecting the UniNet-1 and UniNet-2 cables.

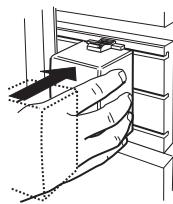
5 Mounting of brackets

CAUTION! Make sure that the ÄKTAdesign instrument is switched off before installing the optional components. The mains power to the ÄKTAdesign instrument must be switched OFF before disconnecting or connecting the UniNet-1 and UniNet-2 cables.

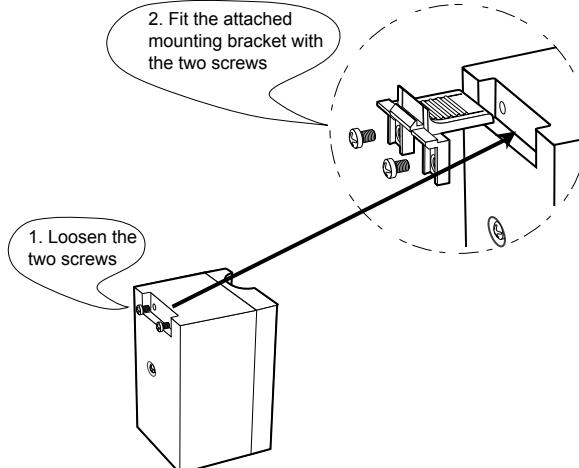
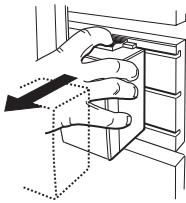
Optional equipment can be mounted on the system. When selecting mounting location for the optional equipment it is important to choose a location which minimize the length of the capillaries used to connect the optional components to the rest of the system.

Many components that are attached to the mounting rails uses a snap-in bracket. The bracket is supplied separately with the component and needs to be fitted as shown below before the component can be attached.

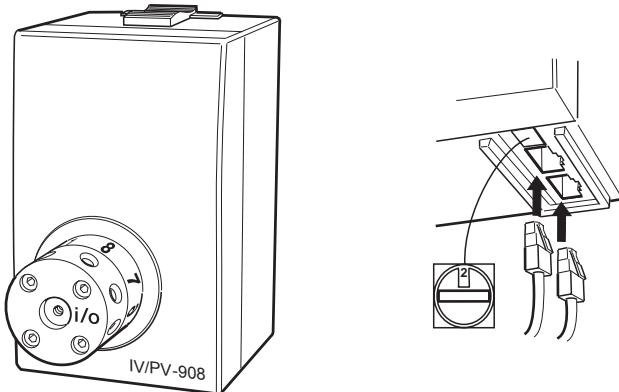
Inserting components



Removing components



5.1 Valve ID



The column selection valve has a unique ID code which identifies it to the UNICORN control system at system start-up. This ID code should be checked before installation.

The ID code for the column selection valve and the corresponding instructions used in UNICORN to control it are as follows:

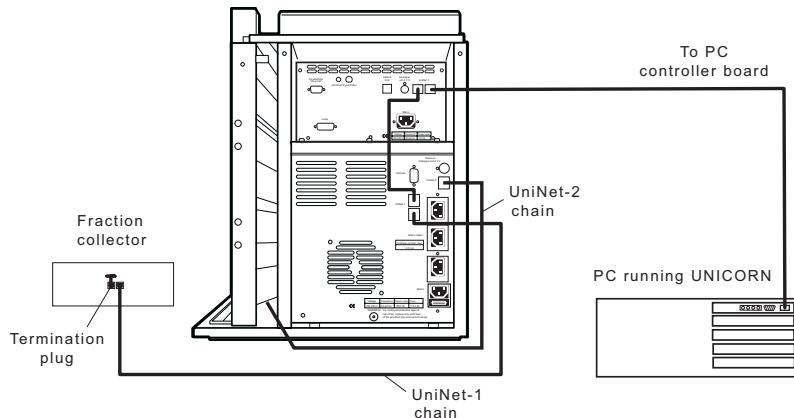
<i>Valve function</i>	<i>ID code</i>	<i>Valve type</i>	<i>Instruction in UNICORN</i>
Column selection	2	PV-908	ColumnPosition (combined instruction controlling both valves)
Column selection	3	PV-908	

Components are connected to the UNICORN control system using either UniNet-1 or UniNet-2 cables. Both the UniNet-1 and the UniNet-2 data communication chain in standard configuration is routed from the rear of the system pump via their respective components to the last component in the chain where it is terminated with a plug.

Note: When Pump P-960 is used, it is always installed as the last component in the UniNet-2 chain. Since the pump has an internal termination, no termination plug is needed.

5.2 UniNet Connection

Both the UniNet-1 and the UniNet-2 chain can be interrupted anywhere between the system pump and the termination plug to interconnect the optional components in the chain. The termination plug can be moved to the last component (furthest away from the system pump), if motivated by cable routing considerations.



Use the attached UniNet-2 cables to connect the valves to the UniNet-2 communication link. The valves can be connected anywhere between the system pump and the termination plug.

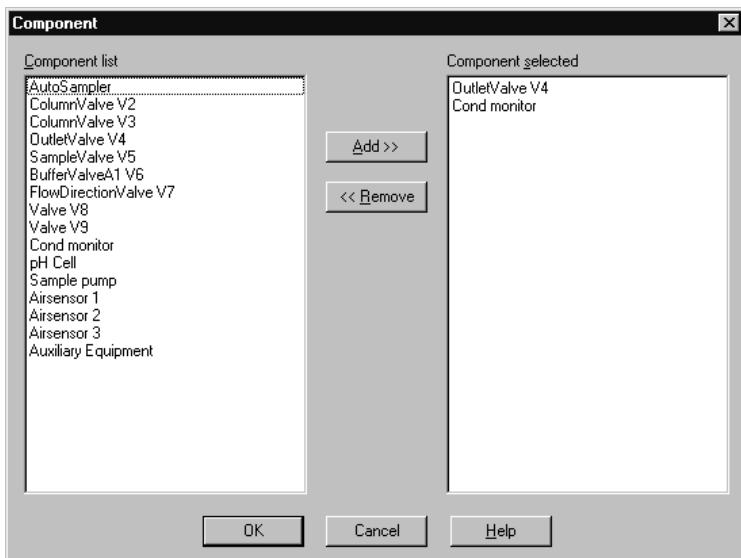
Check that all capillary and electrical connections are carried out correctly.

6 Installation

6.1 Preparation for use

To start your ÄKTAdesign optional configuration system:

- 1 Switch on the ÄKTAdesign instrument with the mains switch located at the front left on the system base.
- 2 Check that the computer and printer are switched on.
- 3 Log in (see *ÄKTAfPLC*-, *ÄKTApurifier*-, or *ÄKTAbasic Making your first runs* respectively).
- 4 In UNICORN Main Menu, select Administration:System Setup.
- 5 Select System and then click Edit. Click Component....



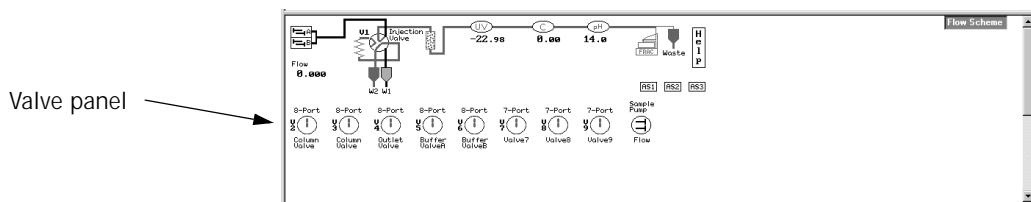
- 6 From the Component list, select the optional column valve you have installed by checking the box, or by clicking ADD.
- 7 Click OK twice and then Close.
- 8 Mark the two PV-908 valves 2 and 3. Check that the ID code switch is set to 2 and 3 respectively.

-
- 9 Mount the brackets and attach the two valves to the system rack (see chapter 5).
 - 10 Cut and mount the new i.d. 0.50 mm or i.d. 0.75 mm capillaries. Mount one capillary between port 1 on column valve 2 and port 1 column valve 3. This is the column bypass position used as default position for the valves in UNICORN.

7 Operation

7.1 Preparing for operation

- 1 A connected valve is automatically recognized by UNICORN at system start-up. Check that the added valve is indicated in the flow scheme in UNICORN.
- 2 Verify that the valve is functioning properly by issuing manual commands from UNICORN as follows:
 - In System Control, select Manual:FlowPath.
 - Select instruction ColumnPosition.
 - Select and execute a new position for the valve. View the valve in the flow scheme panel to confirm that the position change has occurred.
 - Manually run the system pump with distilled water at a flow rate of approximately 2 ml/min, and check that water is coming out from the valve port selected.



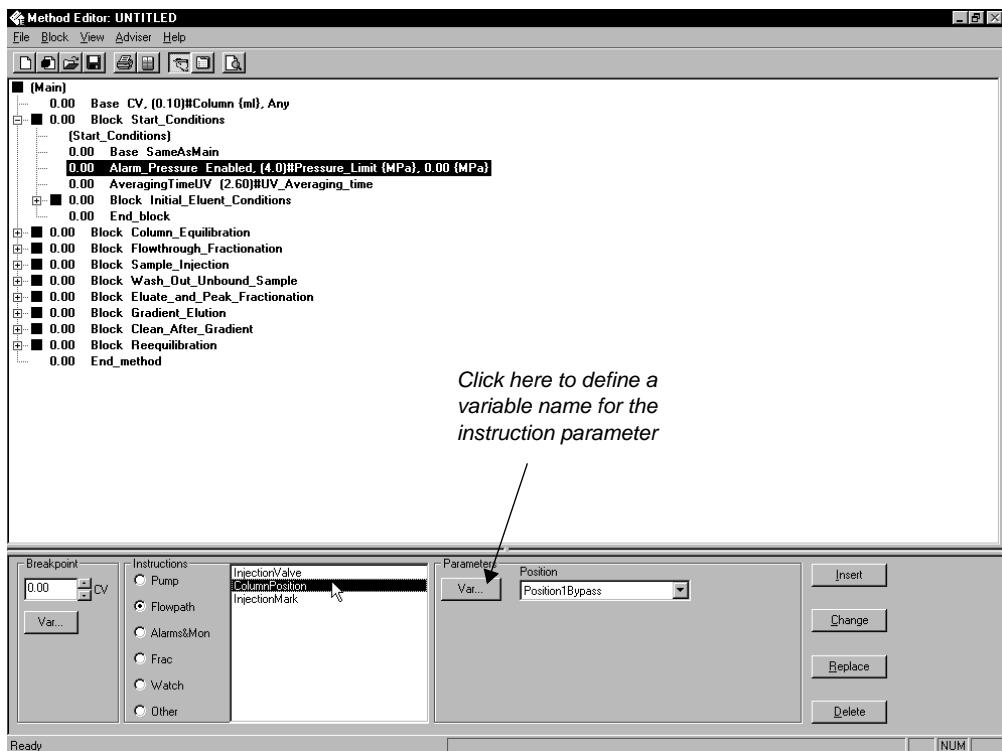
- Connect a capillary to the valve port selected on column valve 2 for stop. Connect this capillary to the same port on column valve 3. Check that water is coming out from the center port of column valve 3.

7.2 ÄKTAfPLC/ÄKTApurifier/ÄKTAbasic - UNICORN 3.2 - 3.21

7.2.1 Using the column selection function in a run

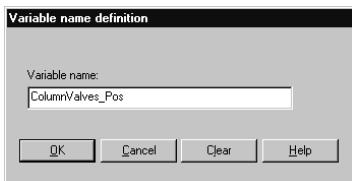
The column selection valves are designated ColumnValves in the flow scheme, and V2_ColPos and V3_ColPos in the run data windows. To use the column selection valves in a method, proceed as follows:

- 1 In the Main Menu, select File>New:Method to create a new method. Select System:, Technique:, Template: and For column:. Click OK.
- 2 Select View:Text instructions to display the text instruction editor. Double-click on the instruction block where you want to add the column selection instruction, e.g. Start_Conditions_zz. Highlight the instruction below to insert the valve instruction.



- 3 Click the Flowpath radio button.
- 4 From the Instructions list, select ColumnPosition. The valve instruction parameter Position allows you to change all eight positions of the column selection valves synchronously.

- 5 Define a variable name for the instruction parameters, e.g. ColumnValves_Pos. This variable allows you to synchronously control the position of the column valves to the position you want.



- 6 Click OK. The defined variable is inserted in the method.
- 7 Return to the Variables page by selecting View:Run setup to set the variable ColumnValves_Pos to the desired position.
- 8 Save the method.

7.3 AKTAfPLC/AKTApurifier/AKTAbasic - UNICORN 4.0 - 4.12

7.3.1 Using the column selection function in a run

To use a valve in a method, select the desired valve options in the Method Wizard when creating the new method.

The column selection valves are designated **ColumnValves** in the flow scheme, and **V2_ColPos** and **V3_ColPos** in the run data window.

